JCB
THE JOURNAL OF CELL BIOLOGY
VOL. 183, NO. 1, OCTOBER 6, 2008

NEWS

In This Issue

2
- No waiting at the nuclear pore complex
- No stretch for spindle assembly checkpoint
- Autophagy inhibitors deliver a knock-out blow
- Tre1 says when, and where, to go
- Random, fast, and out of control
  R. Robinson

People & Ideas

4
- Tae Hoon Kim: Knows his boundaries
  R. Williams

REVIEWS

Comments

7 Novel role for the LKB1 pathway in controlling monocarboxylate fuel transporters
Beatrice Maria Filippi and Dario R. Alessi

RESEARCH ARTICLES

Reports

11 LKB1 induces apical trafficking of Silnoon, a monocarboxylate transporter, in *Drosophila melanogaster*
Cholsoon Jang, Gina Lee, and Jongkyeong Chung

19 The keratin-binding protein Albatross regulates polarization of epithelial cells
Masahiko Sugimoto, Akihito Inoko, Takashi Shiromizu, Masanori Nakayama, Peng Zou, Shigenobu Yonemura, Yuko Hayashi, Ichiro Izawa, Mikio Sasoh, Yukitaka Uji, Kozo Kaibuchi, Tohru Kiyono, and Masaki Inagaki

29 The spindle assembly checkpoint is satisfied in the absence of interkinetochore tension during mitosis with unreplicated genomes
Christopher B. O'Connell, Jadranka Lončarek, Polla Hergert, Antonis Kourtidis, Douglas S. Conklin, and Alexey Khodjakov

Articles

37 AP-2 factors act in concert with Notch to orchestrate terminal differentiation in skin epidermis
Xuan Wang, H. Amalia Pasolli, Trevor Williams, and Elaine Fuchs

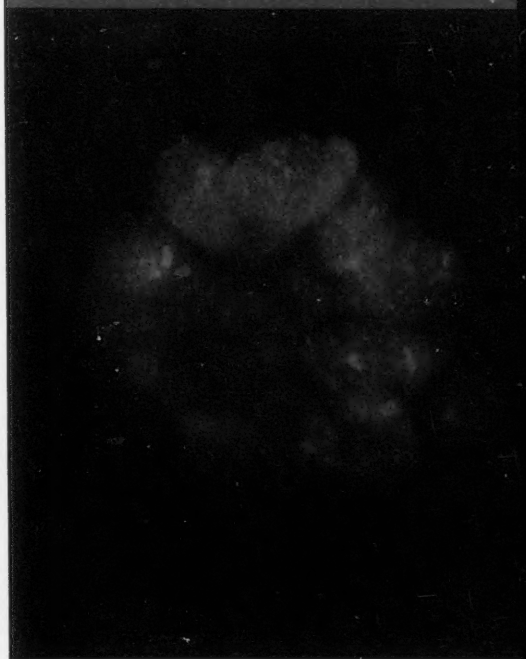
49 Cdk2 and Pin1 negatively regulate the transcriptional corepressor SMRT
Kristopher J. Stanya, Yu Liu, Anthony R. Means, and Hung-Ying Kao

63 Grapes(Chk1) prevents nuclear CDK1 activation by delaying cyclin B nuclear accumulation
Anne Royou, Derek McCusker, Douglas R. Kellogg, and William Sullivan

77 Autonomy and robustness of translocation through the nuclear pore complex: a single-molecule study
Thomas Dange, David Grünwald, Antje Grünwald, Reiner Peters, and Ulrich Kubitscheck

87 The role of GTP binding and hydrolysis at the atToc159 preprotein receptor during protein import into chloroplasts
Fei Wang, Birgit Agne, Felix Kessler, and Danny J. Schnell

Articles with related stories in the IN THIS ISSUE section have page numbers in RED; articles with COMMENTS have page numbers in BLUE.



On the cover

Germ cells are radially organized and polarized in wild-type flies. This orientation, as well as the migration of these cells to the gonads, is lost in flies that lack the G protein–coupled receptor, Tre1. Kunwar et al. explain why.
See page 157.

101 Akt inhibition promotes autophagy and sensitizes PTEN-null tumors to lysosomotropic agents
Michael Degtyarev, Ann De Mazière, Christine Orr, Jie Lin, Brian B. Lee, Janet Y. Tien, Wei W. Prior, Suzanne van Dijk, Hong Wu, Daniel C. Gray, David P. Davis, Howard M. Stern, Lesley J. Murray, Klaus P. Hoeflich, Judith Klumperman, Lori S. Friedman, and Kui Lin

117 Notch1 signaling stimulates proliferation of immature cardiomyocytes
Chiara Collesi, Lorena Zentilin, Gianfranco Sinagra, and Mauro Giacca

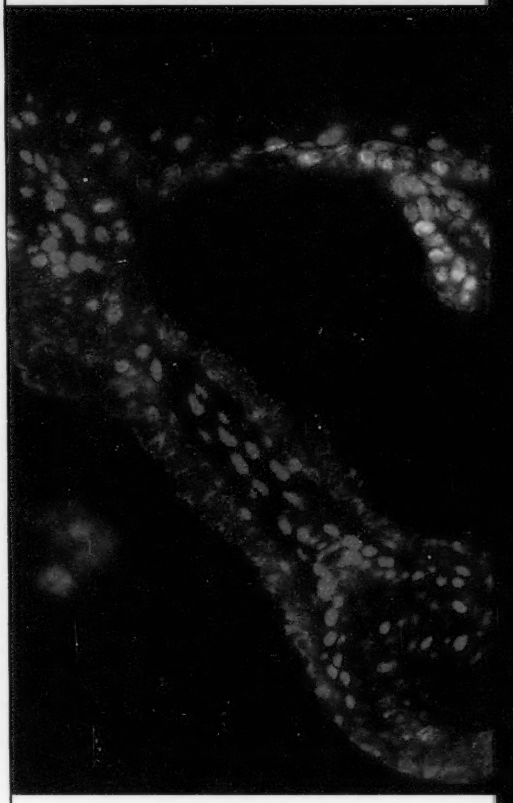
129 Notch activates cell cycle reentry and progression in quiescent cardiomyocytes
Víctor M. Campa, Raquel Gutiérrez-Lanza, Fabio Cerignoli, Ramón Díaz-Trelles, Brandon Nelson, Toshiya Tsuji, Maria Barcova, Wei Jiang, and Mark Mercola

143 Rab-coupling protein coordinates recycling of α5β1 integrin and EGFR1 to promote cell migration in 3D microenvironments
Patrick T. Caswell, May Chan, Andrew J. Lindsay, Mary W. McCaffrey, David Boettiger, and Jim C. Norman

157 Tre1 GPCR initiates germ cell transepithelial migration by regulating *Drosophila melanogaster* E-cadherin
Prabhat S. Kunwar, Hiroko Sano, Andrew D. Renault, Vitor Barbosa, Naoyuki Fuse, and Ruth Lehmann

Corrections

169 The mouth of a dense-core vesicle opens and closes in a concerted action regulated by calcium and amphiphysin
Artur Llobet, Minnie Wu, and Leon Lagnado



AP-2 family transcription factors (AP-2α shown in red) have been implicated in the terminal differentiation of skin (indicated by accumulated keratin, green). Wang et al. performed conditional knockouts of AP-2 family members to dissect the details of their involvement.
See page 37.

JCB
THE JOURNAL OF CELL BIOLOGY
VOL. 183, NO. 2, OCTOBER 20, 2008

NEWS

In This Issue

172
- Flavivirus reveals its access code
- IP blacklist
- APC ain't always necessary for axons
- Astrocyte's clean up job
- Microdomain switching is a bad move for APP

R. Williams

People & Ideas

174
- Qing Zhong: Scoring a slam dunk on the autophagy court

C. Sedwick

REVIEWS

Comments

177 The pH sensor for flavivirus membrane fusion
Stephen C. Harrison

Mini-Reviews

181 Membrane lysis during biological membrane fusion: collateral damage by misregulated fusion machines
Alex Engel and Peter Walter

RESEARCH ARTICLES

Reports

187 SPDL-1 functions as a kinetochore receptor for MDF-1 in *Caenorhabditis elegans*
Takaharu G. Yamamoto, Sonoko Watanabe, Anthony Essex, and Risa Kitagawa

195 Mitochondrial protein import: precursor oxidation in a ternary complex with disulfide carrier and sulfhydryl oxidase
Diana Stojanovski, Dusanka Milenkovic, Judith M. Müller, Kipros Gabriel, Agnes Schulze-Specking, Michael J. Baker, Michael T. Ryan, Bernard Guiard, Nikolaus Pfanner, and Agnieszka Chacinska

203 Putting the model to the test: are APC proteins essential for neuronal polarity, axon outgrowth, and axon targeting?
Nasser M. Rusan, Kathryn Akong, and Mark Peifer

213 Uptake and recycling of pro-BDNF for transmitter-induced secretion by cortical astrocytes
Matteo Bergami, Spartaco Santi, Elena Formaggio, Cinzia Cagnoli, Claudia Verderio, Robert Blum, Benedikt Berninger, Michela Matteoli, and Marco Canossa

Articles

223 Identifying specific protein interaction partners using quantitative mass spectrometry and bead proteomes
Laura Trinkle-Mulcahy, Séverine Boulon, Yun Wah Lam, Roby Urcia, François-Michel Boisvert, Franck Vandermoere, Nick A. Morrice, Sam Swift, Ulrich Rothbauer, Heinrich Leonhardt, and Angus Lamond

241 Replication fork stalling in WRN-deficient cells is overcome by prompt activation of a MUS81-dependent pathway
Annapaola Franchitto, Livia Maria Pirzio, Ennio Prosperi, Orazio Sapora, Margherita Bignami, and Pietro Pichierri

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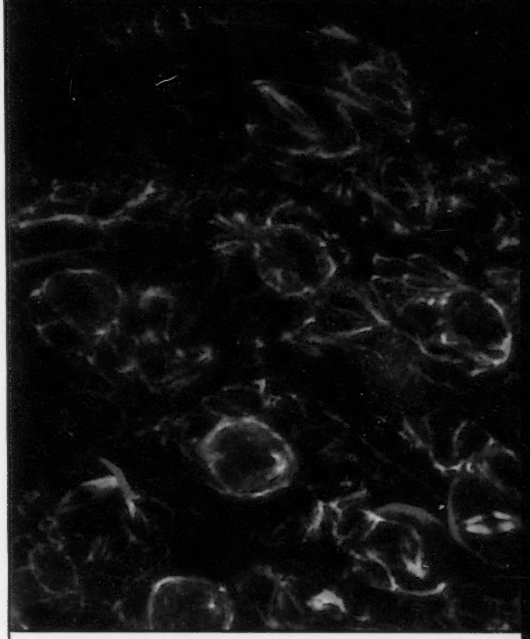


On the cover

Fly neuroblasts polarize perfectly (shown by pink labeling for a polarity marker) even when lacking both APC genes (blue cells that appear purple in combination with pink label). The mutant neuroblasts divide more slowly than wild-type cells and some have bent spindles (green label is tubulin), but axon development is normal.

See page 203.

253 The HINT1 tumor suppressor regulates both γ-H2AX and ATM in response to DNA damage
Haiyang Li, Adayabalam S. Balajee, Tao Su, Bo Cen, Tom K. Hei, and I. Bernard Weinstein

267 The HECT E3 ligase Smurf2 is required for Mad2-dependent spindle assembly checkpoint
Evan C. Osmundson, Dipankar Ray, Finola E. Moore, Qingshen Gao, Gerald H. Thomsen, and Hiroaki Kiyokawa

279 Deconstructing Survivin: comprehensive genetic analysis of Survivin function by conditional knockout in a vertebrate cell line
Zuojun Yue, Ana Carvalho, Zhenjie Xu, Xuemei Yuan, Stefano Cardinale, Susana Ribeiro, Fan Lai, Hiromi Ogawa, Elisabet Gudmundsdottir, Reto Gassmann, Ciaran G. Morrison, Sandrine Ruchaud, and William C. Earnshaw

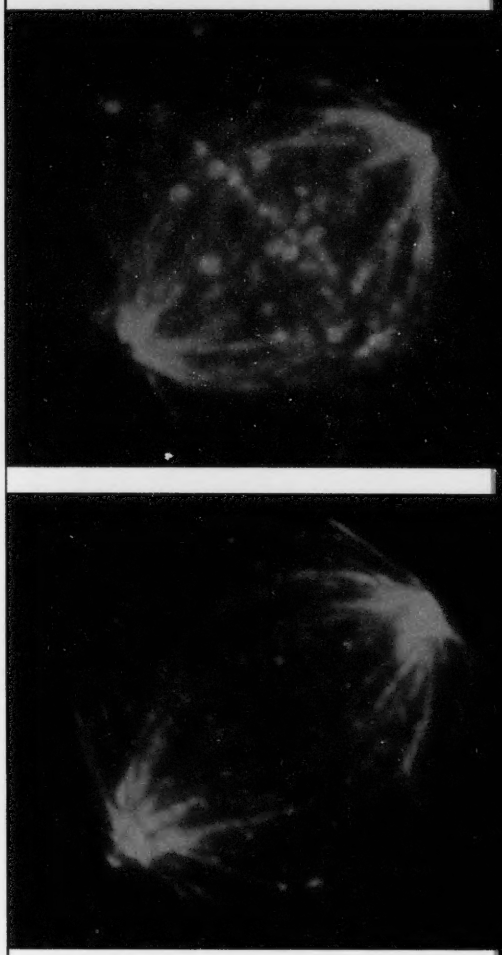
297 Selective coupling of type 6 adenylyl cyclase with type 2 IP_3 receptors mediates direct sensitization of IP_3 receptors by cAMP
Stephen C. Tovey, Skarlatos G. Dedos, Emily J.A. Taylor, Jarrod E. Church, and Colin W. Taylor

313 ODA16 aids axonemal outer row dynein assembly through an interaction with the intraflagellar transport machinery
Noveera T. Ahmed, Chunlei Gao, Ben F. Lucker, Douglas G. Cole, and David R. Mitchell

323 Dual inhibition of SNARE complex formation by tomosyn ensures controlled neurotransmitter release
Toshiaki Sakisaka, Yasunori Yamamoto, Sumiko Mochida, Michiko Nakamura, Kouki Nishikawa, Hiroyoshi Ishizaki, Miki Okamoto-Tanaka, Jun Miyoshi, Yoshinori Fujiyoshi, Toshiya Manabe, and Yoshimi Takai

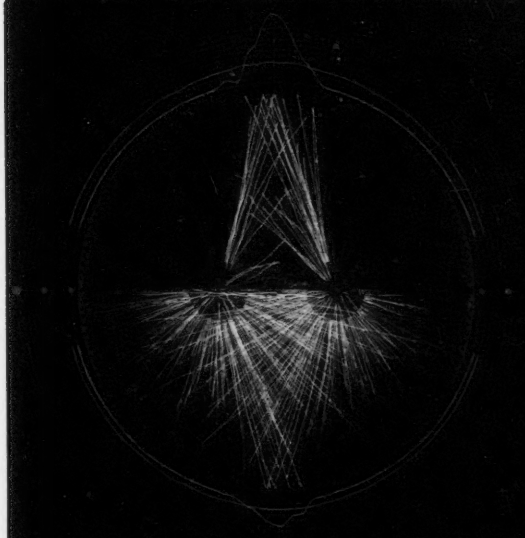
339 Membrane microdomain switching: a regulatory mechanism of amyloid precursor protein processing
Takashi Sakurai, Kumi Kaneko, Misako Okuno, Koji Wada, Taku Kashiyama, Hideaki Shimizu, Takumi Akagi, Tsutomu Hashikawa, and Nobuyuki Nukina

353 Identification of specific histidines as pH sensors in flavivirus membrane fusion
Richard Fritz, Karin Stiasny, and Franz X. Heinz



Survivin (red) has been implicated in apoptosis and mitosis, but most studies of the protein's function have involved its overexpression. Yue et al. now get to the bottom of Survivin's function by performing conditional knockouts. They show that without Survivin, cell division fails (bottom), but response to an apoptosis agent is normal.
See page 279.

JCB
THE JOURNAL OF CELL BIOLOGY
VOL. 183, NO. 3, NOVEMBER 3, 2008



On the cover

Computer simulation of microtubules (yellow and blue) and activated myosin II (distribution shown in pink) at anaphase. In the top half of the image, cells have been treated with nocodazole, which destroys dynamic microtubules (blue), leaving stable microtubules (yellow) that are thought to deliver the activating signal to myosin II.
See page 471.

NEWS

In Memoriam

365 ● George E. Palade, Cell Biology and The *JCB*
I. Mellman

In This Issue

366 ● No direction? Join the crowd
● Sarcospan, a little protein for a big problem
● BBB building
● If you build it, leukocytes will come (in)
● Microtubule failure assists cleavage success
R. Robinson

People & Ideas

368 ● Heather Joseph: Getting the message across
M. Rossner

REVIEWS

Comments

371 Formation of the blood–brain barrier: Wnt signaling seals the deal
Paul Polakis

375 Dances with leukocytes: how tetraspanin-enriched microdomains assemble to form endothelial adhesive platforms
Klaus Ley and Hong Zhang

RESEARCH ARTICLES

Reports

377 Deletion of IFT20 in the mouse kidney causes misorientation of the mitotic spindle and cystic kidney disease
Julie A. Jonassen, Jovenal San Agustin, John A. Follit, and Gregory J. Pazour

385 Sonic Hedgehog signaling impairs ionizing radiation–induced checkpoint activation and induces genomic instability
Jennifer M. Leonard, Hong Ye, Cynthia Wetmore, and Larry M. Karnitz

393 Toll-like receptor 4 restricts retinal progenitor cell proliferation
Ravid Shechter, Ayal Ronen, Asya Rolls, Anat London, Sharon Bakalash, Michael J. Young, and Michal Schwartz

401 Memo–RhoA–mDia1 signaling controls microtubules, the actin network, and adhesion site formation in migrating cells
Kossay Zaoui, Stéphane Honoré, Daniel Isnardon, Diane Braguer, and Ali Badache

409 Wnt/β-catenin signaling controls development of the blood–brain barrier
Stefan Liebner, Monica Corada, Thorsten Bangsow, Jane Babbage, Andrea Taddei, Cathrin J. Czupalla, Marco Reis, Angelina Felici, Hartwig Wolburg, Marcus Fruttiger, Makoto M. Taketo, Harald von Melchner, Karl Heinz Plate, Holger Gerhardt, and Elisabetta Dejana

419 Sarcospan reduces dystrophic pathology: stabilization of the utrophin–glycoprotein complex
Angela K. Peter, Jamie L. Marshall, and Rachelle H. Crosbie

Articles with related stories in the IN THIS ISSUE section have page numbers in RED; articles with COMMENTS have page numbers in BLUE.

Articles

429 The BH3-only protein Bik/Blk/Nbk inhibits nuclear translocation of activated ERK1/2 to mediate IFNγ-induced cell death
Yohannes A. Mebratu, Burton F. Dickey, Chris Evans, and Yohannes Tesfaigzi

441 P bodies promote stress granule assembly in *Saccharomyces cerevisiae*
J. Ross Buchan, Denise Muhlrad, and Roy Parker

457 Stable and dynamic microtubules coordinately shape the myosin activation zone during cytokinetic furrow formation
Victoria E. Foe and George von Dassow

471 An agent-based model contrasts opposite effects of dynamic and stable microtubules on cleavage furrow positioning
Garrett M. Odell and Victoria E. Foe

485 The outer segment serves as a default destination for the trafficking of membrane proteins in photoreceptors
Sheila A. Baker, Mohammad Haeri, Peter Yoo, Sidney M. Gospe III, Nikolai P. Skiba, Barry E. Knox, and Vadim Y. Arshavsky

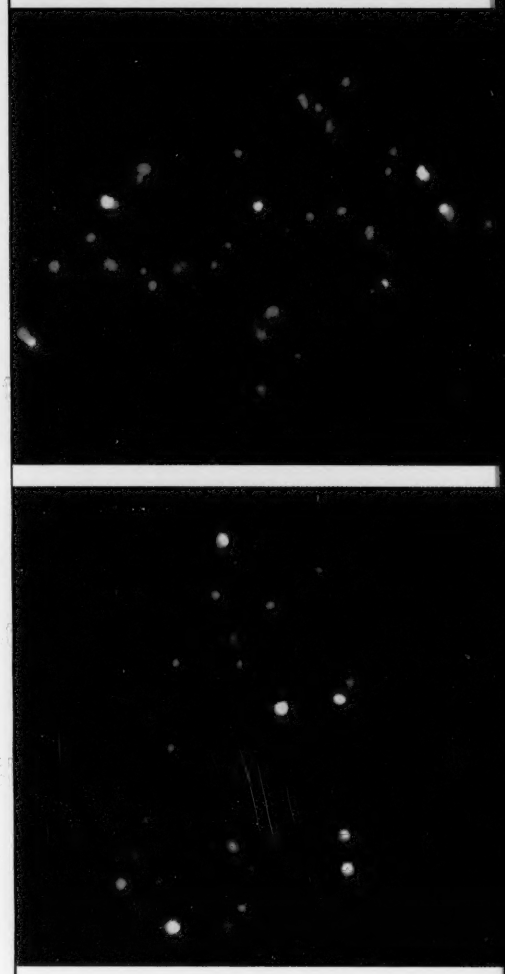
499 Coordinated regulation of AP2 uncoating from clathrin-coated vesicles by rab5 and hRME-6
Sophia Semerdjieva, Barry Shortt, Emma Maxwell, Sukhdeep Singh, Paul Fonarev, Jonathan Hansen, Giampietro Schiavo, Barth D. Grant, and Elizabeth Smythe

513 Regulation of retromer recruitment to endosomes by sequential action of Rab5 and Rab7
Raul Rojas, Thijs van Vlijmen, Gonzalo A. Mardones, Yogikala Prabhu, Adriana L. Rojas, Shabaz Mohammed, Albert J.R. Heck, Graça Raposo, Peter van der Sluijs, and Juan S. Bonifacino

527 Endothelial adhesion receptors are recruited to adherent leukocytes by inclusion in preformed tetraspanin nanoplatforms
Olga Barreiro, Moreno Zamai, María Yáñez-Mó, Emilio Tejera, Pedro López-Romero, Peter N. Monk, Enrico Gratton, Valeria R. Caiolfa, and Francisco Sánchez-Madrid

543 Segregation and activation of myosin IIB creates a rear in migrating cells
Miguel Vicente-Manzanares, Margaret A. Koach, Leanna Whitmore, Marcelo L. Lamers, and Alan F. Horwitz

555 Semaphorin 4D regulates gonadotropin hormone–releasing hormone-1 neuronal migration through PlexinB1–Met complex
Paolo Giacobini, Andrea Messina, Francesca Morello, Nicoletta Ferraris, Simona Corso, Junia Penachioni, Silvia Giordano, Luca Tamagnone, and Aldo Fasolo



Formation of stress granules (green) requires the presence of P bodies (red), but not vice versa. This suggests that stress granules derive the untranslated mRNAs that they store from P bodies.
See page 441.

JCB
THE JOURNAL OF CELL BIOLOGY
VOL. 183, NO. 4, NOVEMBER 17, 2008

NEWS

In This Issue

568 • Cdc42 turns the spindle
• A get-together for caspases
• Axons lose their identity
• Uniting to save cancer cells
• DNA healer
M. Leslie

People & Ideas

570 • Rebecca Heald: Passionate about cycles
C. Sedwick

Editorial

573 A false sense of security
Mike Rossner

REVIEWS

Comments

575 Limiting lumens: a new role for Cdc42
Terry Lechler

579 Caspase-8 goes cardiolipin: a new platform to provide mitochondria with microdomains of apoptotic signals?
Luca Scorrano

Mini-Reviews

583 Cytoplasmic diffusion: molecular motors mix it up
Clifford P. Brangwynne, Gijsje H. Koenderink, Frederick C. MacKintosh, and David A. Weitz

RESEARCH ARTICLES

Reports

589 Nucleolar protein B23/nucleophosmin regulates the vertebrate SUMO pathway through SENP3 and SENP5 proteases
Chawon Yun, Yonggang Wang, Debaditya Mukhopadhyay, Peter Backlund, Nagamalleswari Kolli, Alfred Yergey, Keith D. Wilkinson, and Mary Dasso

597 HP1-β is required for development of the cerebral neocortex and neuromuscular junctions
Rebecca Aucott, Jörn Bullwinkel, Yang Yu, Wei Shi, Mustafa Billur, Jeremy P. Brown, Ursula Menzel, Dimitris Kioussis, Guozheng Wang, Ingrid Reisert, Jörg Weimer, Raj K. Pandita, Girdhar G. Sharma, Tej K. Pandita, Reinald Fundele, and Prim B. Singh

607 Golgi coiled-coil proteins contain multiple binding sites for Rab family G proteins
Rita Sinka, Alison K. Gillingham, Vangelis Kondylis, and Sean Munro

617 A kinesin-13 mutant catalytically depolymerizes microtubules in ADP
Michael Wagenbach, Sarah Domnitz, Linda Wordeman, and Jeremy Cooper

625 Cdc42 controls spindle orientation to position the apical surface during epithelial morphogenesis
Aron B. Jaffe, Noriko Kaji, Joanne Durgan, and Alan Hall

635 AnkyrinG is required for maintenance of the axon initial segment and neuronal polarity
Kristian L. Hedstrom, Yasuhiro Ogawa, and Matthew N. Rasband

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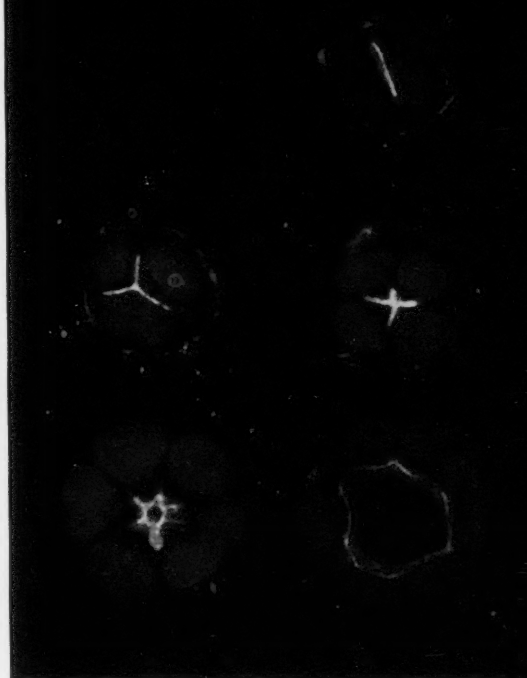


On the cover

Cells in a model intestine face the right way thanks to Cdc42. The protein ensures the mitotic spindles of gut cells always align perpendicular to the center of the growing structure; in turn this ensures the cell's apical surfaces (green) always face one central lumen.
See page 625.

Articles

641 Histone H3 lysine 56 acetylation by Rtt109 is crucial for chromosome positioning
Shin-ichiro Hiraga, Sotirios Botsios, and Anne D. Donaldson

653 Fast regulation of AP-1 activity through interaction of lamin A/C, ERK1/2, and c-Fos at the nuclear envelope
José María González, Ana Navarro-Puche, Berta Casar, Piero Crespo, and Vicente Andrés

667 Phosphorylation sites in BubR1 that regulate kinetochore attachment, tension, and mitotic exit
Haomin Huang, James Hittle, Francesca Zappacosta, Roland S. Annan, Avram Hershko, and Timothy J. Yen

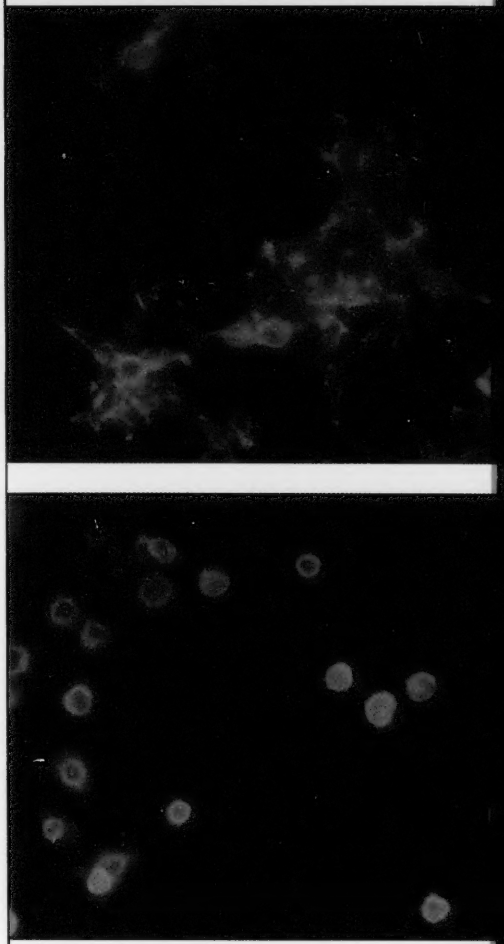
681 Cardiolipin provides an essential activating platform for caspase-8 on mitochondria
Francois Gonzalvez, Zachary T. Schug, Riekelt H. Houtkooper, Elaine D. MacKenzie, David G. Brooks, Ronald J.A. Wanders, Patrice X. Petit, Frédéric M. Vaz, and Eyal Gottlieb

697 RhoA–ROCK and p38MAPK-MSK1 mediate vitamin D effects on gene expression, phenotype, and Wnt pathway in colon cancer cells
Paloma Ordóñez-Morán, María Jesús Larriba, Héctor G. Pálmer, Ruth A. Valero, Antonio Barbáchano, Mireia Duñach, Antonio García de Herreros, Carlos Villalobos, María Teresa Berciano, Miguel Lafarga, and Alberto Muñoz

711 Induction of cell retraction by the combined actions of Abl–CrkII and Rho–ROCK1 signaling
XiaoDong Huang, Diana Wu, Hua Jin, Dwayne Stupack, and Jean Y.J. Wang

725 Differential roles of ArfGAP1, ArfGAP2, and ArfGAP3 in COPI trafficking
Carolin Weimer, Rainer Beck, Priska Eckert, Ingeborg Reckmann, Jörg Moelleken, Britta Brügger, and Felix Wieland

737 p120 catenin induces opposing effects on tumor cell growth depending on E-cadherin expression
Edwin Soto, Masahiro Yanagisawa, Laura A. Marlow, John A. Copland, Edith A. Perez, and Panos Z. Anastasiadis



Every long journey begins with a first step. Huang et al. show how two molecular pathways collaborate to help a cell lift its feet. The tyrosine kinase, Abl, heads up one pathway that results in reduced integrin affinity for the extracellular matrix, while Rho–ROCK1 controls the second pathway that leads to cell contractility.
See page 711.

JCB
THE JOURNAL OF CELL BIOLOGY
VOL. 183, NO. 5, DECEMBER 1, 2008

NEWS

In This Issue

752
- Claudin 11 stops the leaks
- Parkin cleans house
- *Dictyostelium* cells lay a breadcrumb trail
- Cofilin activity is a total coincidence
- Dynein gives the "all clear"
  C. Sedwick

People & Ideas

754
- Brett Lindenbach: Deconstructing and reconstructing hepatitis C
  R. Williams

REVIEWS

Comments

757 Parkin mitochondria in the autophagosome
Heidi M. McBride

Mini-Reviews

761 The Mad2 partial unfolding model: regulating mitosis through Mad2 conformational switching
John J. Skinner, Stacey Wood, James Shorter, S. Walter Englander, and Ben E. Black

RESEARCH ARTICLES

Reports

769 Recruitment of RNA polymerase II cofactor PC4 to DNA damage sites
Oliver Mortusewicz, Wera Roth, Na Li, M. Cristina Cardoso, Michael Meisterernst, and Heinrich Leonhardt

777 Multiple autophosphorylation sites are dispensable for murine ATM activation in vivo
Jeremy A. Daniel, Manuela Pellegrini, Ji-Hoon Lee, Tanya T. Paull, Lionel Feigenbaum, and André Nussenzweig

785 *Schizosaccharomyces pombe* Pak-related protein, Pak1p/Orb2p, phosphorylates myosin regulatory light chain to inhibit cytokinesis
Tsui-Han Loo and Mohan Balasubramanian

795 Parkin is recruited selectively to impaired mitochondria and promotes their autophagy
Derek Narendra, Atsushi Tanaka, Der-Fen Suen, and Richard J. Youle

Articles

805 Genome-wide analysis reveals a cell cycle–dependent mechanism controlling centromere propagation
Sylvia Erhardt, Barbara G. Mellone, Craig M. Betts, Weiguo Zhang, Gary H. Karpen, and Aaron F. Straight

819 Phosphorylation regulates targeting of cytoplasmic dynein to kinetochores during mitosis
Jacqueline Whyte, Jason R. Bader, Sinji B.F. Tauhata, Maurice Raycroft, Jessica Hornick, K. Kevin Pfister, William S. Lane, Gordon K. Chan, Edward H. Hinchcliffe, Patricia S. Vaughan, and Kevin T. Vaughan

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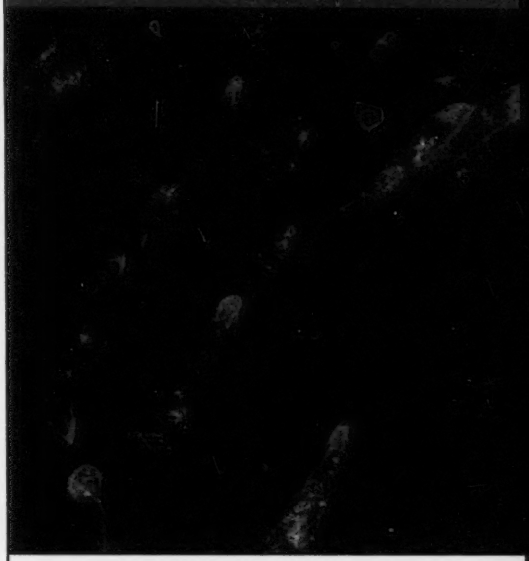


On the cover

When *Dictyostelium* cells get together they migrate in a coordinated head-to-tail procession. They maintain this arrangement, as Kriebel et al. now show, because each cell deposits ACA-containing (green) chemoattractant vesicles from its rear.
See page 949.

835 FAM29A promotes microtubule amplification via recruitment of the NEDD1–γ-tubulin complex to the mitotic spindle
Hui Zhu, Judith A. Coppinger, Chang-Young Jang, John R. Yates III, and Guowei Fang

849 CaMKII locally encodes L-type channel activity to signal to nuclear CREB in excitation–transcription coupling
Damian G. Wheeler, Curtis F. Barrett, Rachel D. Groth, Parsa Safa, and Richard W. Tsien

865 Cofilin is a pH sensor for actin free barbed end formation: role of phosphoinositide binding
Christian Frantz, Gabriela Barreiro, Laura Dominguez, Xiaoming Chen, Robert Eddy, John Condeelis, Mark J.S. Kelly, Matthew P. Jacobson, and Diane L. Barber

881 μ2 adaptin facilitates but is not essential for synaptic vesicle recycling in *Caenorhabditis elegans*
Mingyu Gu, Kim Schuske, Shigeki Watanabe, Qiang Liu, Paul Baum, Gian Garriga, and Erik M. Jorgensen

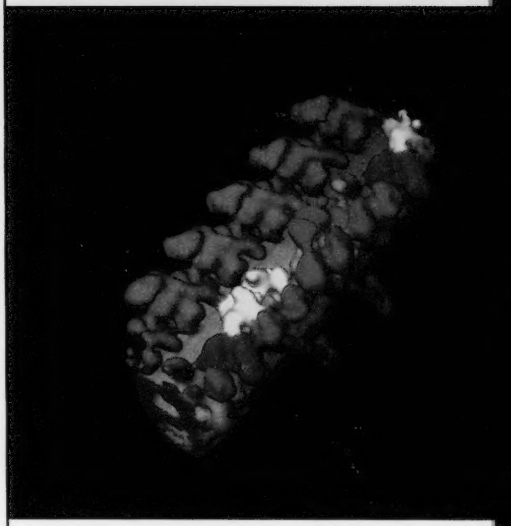
893 Synapses are regulated by the cytoplasmic tyrosine kinase Fer in a pathway mediated by p120catenin, Fer, SHP-2, and β-catenin
Seung-Hye Lee, I.-Feng Peng, Yu Gie Ng, Masahiro Yanagisawa, Shernaz X. Bamji, Lisa P. Elia, Janne Balsamo, Jack Lilien, Panos Z. Anastasiadis, Erik M. Ullian, and Louis F. Reichardt

909 Tight junctions potentiate the insulative properties of small CNS myelinated axons
Jerome Devaux and Alexander Gow

923 Molecular architecture of inner dynein arms in situ in *Chlamydomonas reinhardtii* flagella
Khanh Huy Bui, Hitoshi Sakakibara, Tandis Movassagh, Kazuhiro Oiwa, and Takashi Ishikawa

933 Regulation of EphB2 activation and cell repulsion by feedback control of the MAPK pathway
Alexei Poliakov, Maria L. Cotrina, Andrea Pasini, and David G. Wilkinson

949 Collective cell migration requires vesicular trafficking for chemoattractant delivery at the trailing edge
Paul W. Kriebel, Valarie A. Barr, Erin C. Rericha, Guofeng Zhang, and Carole A. Parent



Dynein controls the beating of a flagellum or cilium via microtubule movement within the central axoneme. While much of dynein's molecular structure had been determined, that of its inner arms had not. This has now been put to rights by Bui et al.
See page 923.

JCB
THE JOURNAL OF CELL BIOLOGY
VOL. 183, NO. 6, DECEMBER 15, 2008

NEWS

In This Issue

964
- Multiple axons and actions with PSD-95
- Junction protein goes on the road
- CK2: channel controller
- The actin flow paradox
- FHL1 adds some muscle

R. Williams and B. Short

People & Ideas

966
- Andrea Ladd: Getting to the heart of alternative splicing control

R. Williams

Editorial

969 Announcing the *JCB DataViewer*, a browser-based application for viewing original image files
Emma Hill

REVIEWS

Comments

971 Regulating polarity by directing traffic: Cdc42 prevents adherens junctions from **Crumblin'** a**Part**
Mara C. Duncan and Mark Peifer

975 Na^+ channels get anchored…with a little help
Matthew N. Rasband

RESEARCH ARTICLES

Reports

979 Assembly of normal actomyosin rings in the absence of Mid1p and cortical nodes in fission yeast
Yinyi Huang, Hongyan Yan, and Mohan K. Balasubramanian

989 α–E-catenin binds to dynamitin and regulates dynactin-mediated intracellular traffic
Wen-Hui Lien, Vladimir I. Gelfand, and Valeri Vasioukhin

999 Traction stress in focal adhesions correlates biphasically with actin retrograde flow speed
Margaret L. Gardel, Benedikt Sabass, Lin Ji, Gaudenz Danuser, Ulrich S. Schwarz, and Clare M. Waterman

Articles

1007 CaM kinase II initiates meiotic spindle depolymerization independently of APC/C activation
Simone Reber, Sabine Over, Iva Kronja, and Oliver J. Gruss

1019 A handcuff model for the cohesin complex
Nenggang Zhang, Sergey G. Kuznetsov, Shyam K. Sharan, Kaiyi Li, Pulivarthi H. Rao, and Debananda Pati

1033 Identification of FHL1 as a regulator of skeletal muscle mass: implications for human myopathy
Belinda S. Cowling, Meagan J. McGrath, Mai-Anh Nguyen, Denny L. Cottle, Anthony J. Kee, Susan Brown, Joachim Schessl, Yaqun Zou, Josephine Joya, Carsten G. Bönnemann, Edna C. Hardeman, and Christina A. Mitchell

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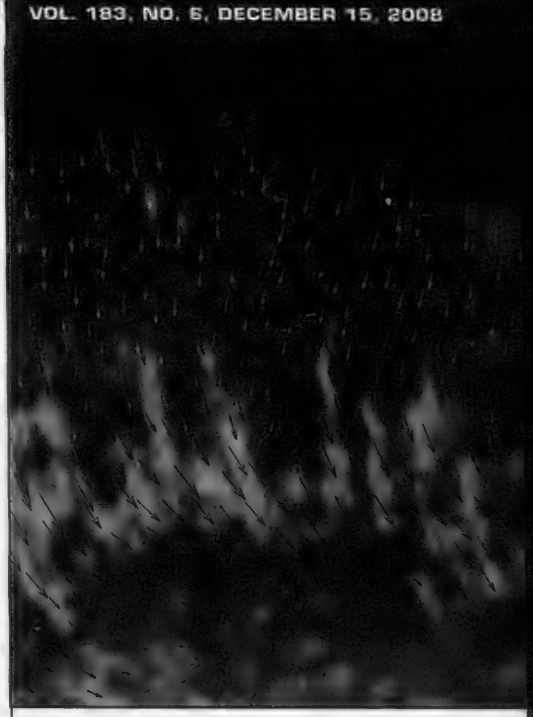


On the cover

Gardel et al. show that at the leading edge of a migrating cell, the speed of actin retrograde flow (blue arrows) and traction force (black arrows) are biphasically related—a somewhat unexpected discovery.
See page 999.

1049 FoxK mediates TGF-β signalling during midgut differentiation in flies
Sergio Casas-Tinto, Melisa Gomez-Velazquez, Begoña Granadino, and Pedro Fernandez-Funez

1061 Assembly of the PtdIns 4-kinase Stt4 complex at the plasma membrane requires Ypp1 and Efr3
Dan Baird, Chris Stefan, Anjon Audhya, Sabine Weys, and Scott D. Emr

1075 Plasma membrane microdomains regulate turnover of transport proteins in yeast
Guido Grossmann, Jan Malinsky, Wiebke Stahlschmidt, Martin Loibl, Ina Weig-Meckl, Wolf B. Frommer, Miroslava Opekarová, and Widmar Tanner

1089 Binding interactions control SNARE specificity in vivo
Hui-Ju Yang, Hideki Nakanishi, Song Liu, James A. McNew, and Aaron M. Neiman

1101 Protein kinase CK2 contributes to the organization of sodium channels in axonal membranes by regulating their interactions with ankyrin G
Aline Bréchet, Marie-Pierre Fache, Anna Brachet, Géraldine Ferracci, Agnés Baude, Marie Irondelle, Sandrine Pereira, Christophe Leterrier, and Bénédicte Dargent

1115 PSD-95 promotes synaptogenesis and multiinnervated spine formation through nitric oxide signaling
Irina Nikonenko, Bernadett Boda, Sylvain Steen, Graham Knott, Egbert Welker, and Dominique Muller

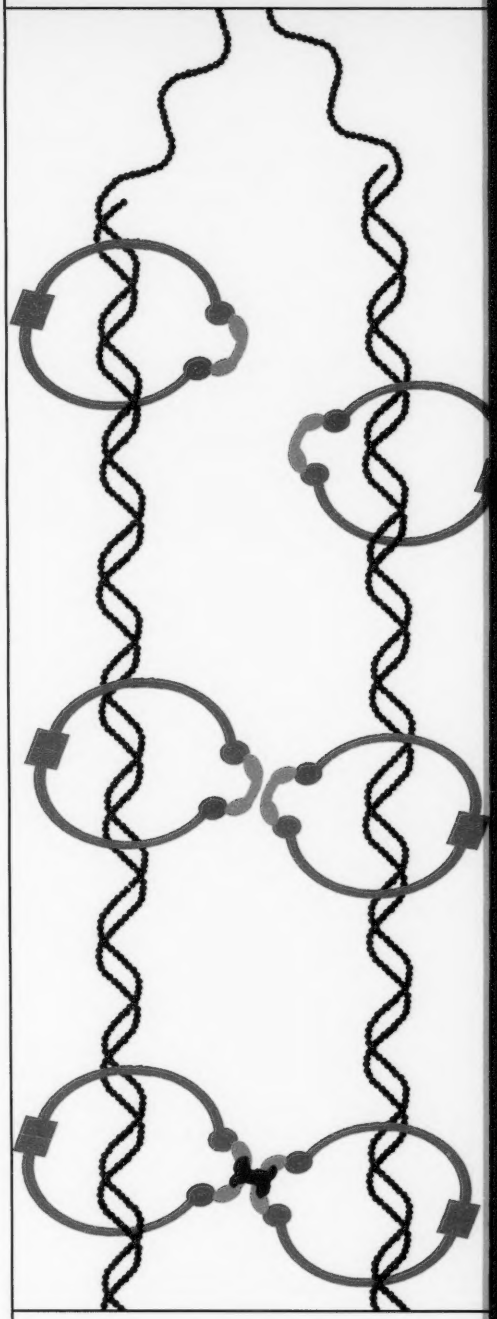
1129 Cdc42 and Par proteins stabilize dynamic adherens junctions in the *Drosophila* neuroectoderm through regulation of apical endocytosis
Kathryn P. Harris and Ulrich Tepass

1145 The angiogenic response is dictated by β_3 integrin on bone marrow–derived cells
Weiyi Feng, N. Patrick McCabe, Ganapati H. Mahabeleshwar, Payaningal R. Somanath, David R. Phillips, and Tatiana V. Byzova

1159 JAM-L–mediated leukocyte adhesion to endothelial cells is regulated in cis by α4β1 integrin activation
Anny-Claude Luissint, Pierre G. Lutz, David A. Calderwood, Pierre-Olivier Couraud, and Sandrine Bourdoulous

Corrections

1175 Quantitative analysis of autophagy-related protein stoichiometry by fluorescence microscopy
Jiefei Geng, Misuzu Baba, Usha Nair, and Daniel J. Klionsky



The cohesin complex holds sister chromatids together. Analyses of the protein interactions within the complex suggest cohesin forms two rings and links the chromatids like a pair of handcuffs.
See page 1019.

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NEWS

In This Issue

1178
- Cardio(lipin) workout beefs up mitochondrial imports
- DNA, just chill
- Leptin's long-distance call to the pancreas
- Matrix fragments trigger fatal excitement
- Slow down, enzymes at work
  M. Leslie

People & Ideas

1180
- Kai Simons: Membrane master
  C. Sedwick

REVIEWS

Comments

1183 EBs clip CLIPs to growing microtubule ends
Torsten Wittmann

Mini-Reviews

1187 Nanotubes, exosomes, and nucleic acid–binding peptides provide novel mechanisms of intercellular communication in eukaryotic cells: implications in health and disease
Mattias Belting and Anders Wittrup

RESEARCH ARTICLES

Reports

1193 Three-dimensional localization of CENP-A suggests a complex higher order structure of centromeric chromatin
Owen J. Marshall, Alan T. Marshall, and K.H. Andy Choo

1203 PARP-1 ensures regulation of replication fork progression by homologous recombination on damaged DNA
Kazuto Sugimura, Shin-ichiro Takebayashi, Hiroshi Taguchi, Shunichi Takeda, and Katsuzumi Okumura

1213 The translocator maintenance protein Tam41 is required for mitochondrial cardiolipin biosynthesis
Stephan Kutik, Michael Rissler, Xue Li Guan, Bernard Guiard, Guanghou Shui, Natalia Gebert, Philip N. Heacock, Peter Rehling, William Dowhan, Markus R. Wenk, Nikolaus Pfanner, and Nils Wiedemann

1223 CLIP-170 tracks growing microtubule ends by dynamically recognizing composite EB1/tubulin-binding sites
Peter Bieling, Stefanie Kandels-Lewis, Ivo A. Telley, Juliette van Dijk, Carsten Janke, and Thomas Surrey

1235 The sympathetic tone mediates leptin's inhibition of insulin secretion by modulating osteocalcin bioactivity
Eiichi Hinoi, Nan Gao, Dae Young Jung, Vijay Yadav, Tatsuya Yoshizawa, Martin G. Myers Jr., Streamson C. Chua Jr., Jason K. Kim, Klaus H. Kaestner, and Gerard Karsenty

Articles

1243 Coordinated control of self-renewal and differentiation of neural stem cells by Myc and the p19^{ARF}–p53 pathway
Motoshi Nagao, Kenneth Campbell, Kevin Burns, Chia-Yi Kuan, Andreas Trumpp, and Masato Nakafuku

Articles with related stories in the IN THIS ISSUE section have page numbers in RED; articles with COMMENTS have page numbers in BLUE.

On the cover

DNA single-strand repair protein, Parp-1 (green dots), also helps with double-strand breaks, according to Sugimura et al. At replicating regions of the genome (red and bue dots) Parp-1 slows the replication fork to allow double-strand repair enzymes to work.
See page 1203.

1259 UBF levels determine the number of active ribosomal RNA genes in mammals
Elaine Sanij, Gretchen Poortinga, Kerith Sharkey, Sandy Hung, Timothy P. Holloway, Jaclyn Quin, Elysia Robb, Lee H. Wong, Walter G. Thomas, Victor Stefanovsky, Tom Moss, Lawrence Rothblum, Katherine M. Hannan, Grant A. McArthur, Richard B. Pearson, and Ross D. Hannan

1275 The peroxisomal membrane protein import receptor Pex3p is directly transported to peroxisomes by a novel Pex19p- and Pex16p-dependent pathway
Takashi Matsuzaki and Yukio Fujiki

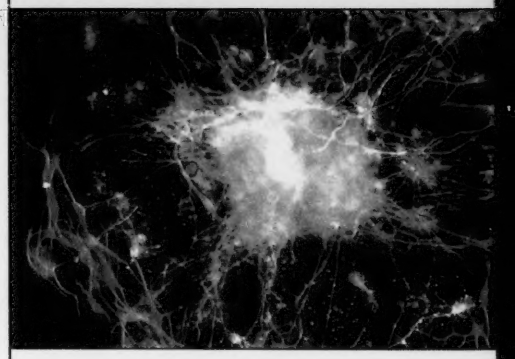
1287 The microtubule-binding protein CLIP-170 coordinates mDia1 and actin reorganization during CR3-mediated phagocytosis
Elodie Lewkowicz, Floriane Herit, Christophe Le Clainche, Pierre Bourdoncle, Franck Perez, and Florence Niedergang

1299 Proteolytic fragments of laminin promote excitotoxic neurodegeneration by up-regulation of the KA1 subunit of the kainate receptor
Zu-Lin Chen, Huaxu Yu, Wei-Ming Yu, Robert Pawlak, and Sidney Strickland

Corrections

1315 Uniting to save cancer cells
Mitch Leslie

1317 A false sense of security
Mike Rossner



Neural stem cells must balance self-renewal with differentiation into either neurons (red) or glial cells (blue and green). Nagao et al. show that this is coordinated by the protooncoprotein Myc and the tumor suppressor $p19^{ARF}$.
See page 1243.